CLAIMS

What is claimed is:

1. A polyester and alkyd polymer dispersion comprising polymers having backbone ester linkages, wherein at least a portion of the backbone ester linkages are formed from secondary and/or tertiary hydroxy groups.

2. The polyester and alkyd polymer dispersion of claim 1, wherein at least 5 mole percent of the backbone ester linkages are formed from secondary and/or tertiary hydroxy groups.

3. The polyester and alkyd polymer dispersion of claim 1, wherein at least 25 mole percent of the backbone ester linkages are formed from secondary hydroxy groups.

4. The polyester and alkyd polymer dispersion of claim 3, wherein the secondary hydroxy groups originate from polyols selected from the group consisting of 2,2,4-trimethyl pentanediol, 2,2'-bis (4-hydroxycyclohexy) propane (hydrogenated bisphenol A), propylene glycol, di-propylene glycol, poly (propylene glycol), glycerol, and sorbitol.

5. The polyester and alkyd polymer dispersion of claim 1, further comprising backbone ester linkages formed from primary hydroxy groups.

6. The polyester and alkyd polymer dispersion of claim 5, wherein the primary hydroxy groups originate from polyols selected from the group consisting of trimethylol propane, pentaerythritol, di-pentaerythritol, trimethylol ethane, neopentyl glycol, ethylene glycol, 1,3-butanediol, 1,4-butanediol, 1,6-hexanediol, 1,4-cyclohexyl dimethanol, diethylene glycol, triethylene glycol, poly (ethylene glycol), poly (tetrahydrofuran), poly(caprolactone) diol, poly(caprolactone) triol, trimethylol mono allylether, trimethylol diallyl ether, pentaerythritol triallylether, pentaerythritol diallyl ether, pentaerythritol mono allylether, 2-ethyl-2-(hydroxymethyl)-1,3-propanediol, and 2-methyl 1,3-propanediol.

7. A hydrolytically stable polymer dispersion comprising polymers having polymer backbone ester linkages, wherein at least 5 mole percent of the polymer backbone ester linkages are formed from secondary hydroxy groups.

8. The hydrolytically stable polymer dispersion of claim 7, wherein the polymer backbone ester linkages are formed from alkyl substituted epoxy compounds and alkyl substituted cyclic carbonates.

9. The hydrolytically stable polymer dispersion of claim 8, wherein the epoxy compounds and alkyl substituted cyclic carbonates are selected from the group consisting of glycidyl neodecanoate, diglycidyl ether of bisphenol A, diglycidyl ether of bisphenol F, pentaerythritol poly glycidyl ether, sorbitol polyglycydyl ether, propylene oxide, and propylene carbonate.

10. The hydrolytically stable polymer dispersion of claim 7, further comprising ester linkages formed from primary hydroxy groups.

11. The hydrolytically stable polymer dispersion of claim 10, wherein the primary hydroxy groups originate from polyols selected from the group consisting of trimethylol propane, pentaerythritol, di-pentaerythritol, trimethylol ethane, neopentyl glycol, ethylene glycol, 1,3-butanediol, 1,4-butanediol, 1,6-hexanediol, 1,4-cyclohexyl dimethanol, diethylene glycol, triethylene glycol, poly (ethylene glycol), poly (tetrahydrofuran), poly(caprolactone) diol, poly(caprolactone) triol, trimethylol mono allylether, trimethylol diallyl ether, pentaerythritol triallylether, pentaerythritol diallyl ether, pentaerythritol mono allylether, 2-ethyl-2-(hydroxymethyl)-1,3-propanediol, and 2-methyl 1,3-propanediol.

12. A method for forming a hydrolytically stable polymer dispersion, comprising: forming polymers having backbone ester linkages from reactants selected from the group consisting of secondary hydroxy-containing polyols, primary hydroxy-containing polyols, polyacids, oils, fatty acids, mono-functional acids, and mono-functional alcohols; and dispersing said polymers.

13. The method of claim 12, wherein the secondary hydroxy-containing polyols are selected from the group consisting of 2,2,4-trimethyl pentanediol, 2,2'-bis (4-hydroxycyclohexy) propane(hydrogenated bisphenol A), propylene glycol, di-propylene glycol, poly (propylene glycol), glycerol, and sorbitol.

14. The method of claim 12, wherein the primary hydroxy-containing polyols are selected from the group consisting of trimethylol propane, pentaerythritol, di-pentaerythritol, trimethylol ethane, neopentyl glycol, ethylene glycol, 1,3-butanediol, 1,4-butanediol, 1,6-hexanediol, 1,4-cyclohexyl dimethanol, diethylene glycol, triethylene glycol, poly (ethylene glycol), poly (tetrahydrofuran), poly(caprolactone) diol, poly(caprolactone) triol, trimethylol mono allylether, trimethylol diallyl ether, pentaerythritol triallylether, pentaerythritol diallyl ether, pentaerythritol mono allylether, 2-ethyl-2-(hydroxymethyl)-1,3-propanediol, and 2-methyl 1,3-propanediol.

15. The method of claim 12, wherein the polyacids are selected from the group consisting of isophthalic acid, terephthalic acid, 5-(sodiosulfo)-isophthalic acid, trimellitic anhydride, adipic acid, 1,4-cyclohexyl dicarboxylic acid, succinic anhydride, maleic acid, fumaric acid, succinic acid, azaleic acid, sebacic acid, methyl succinic anhydride, dodecenyl succinic anhydride, tetrahydrophthalic anhydride, hexahydrophthalic anhydride, and phthalic anhydride.

16. The method of claim 12, wherein the oils are selected from the group consisting of sunflower oil, toll oil, soybean oil, safflower oil, linseed oil, castor oil, dehydrated castor oil and tung oil.

17. The method of claim 12, wherein the fatty acids are selected from the group consisting of sunflower fatty acid, toll oil fatty acid, linseed oil fatty acid, safflower oil fatty acid, dehydrated castor oil fatty acid and soybean oil fatty acid.

18. The method of claim 12, wherein the mono-functional acids are selected from the group consisting of benzoic acid and aliphatic hydrocarbon acids.

19. The method of claim 12, wherein the mono-functional alcohols are selected from the group consisting of alkoxy terminated poly(ethylene glycol) and alkoxy terminated poly(propylene) glycol.

20. The method of claim 12, further comprising forming the hydrolytically stable polymer dispersion by salt formation between an amine and a carboxylic group chemically bound to at least a portion of the polymers of the hydrolytically stable polymer dispersion.

21. The method of claim 20, further comprising reacting di-hydroxy compounds with tertiary carboxylic groups.

22. The method of claim 20, further comprising reacting at least one amine with the polymers of the hydrolytically stable polymer dispersion.

23. The method of claim 22, wherein the at least one amine is selected from the group consisting of aqueous ammonia, triethyl amine, N,N-dimethyl ethanol amine and N-methyl morpholine.

24. The method of claim 12, further comprising reacting the polymers of the hydrolytically stable polymer dispersion with an anhydride.

25. The method of claim 24, wherein the anhydride is selected from the group consisting of trimellitic anhydride, maleic anhydride, phthalic anhydride, dodecenyl succinic anhydride, pyromellitic dianhydride, cyclohexane dicarboxylic anhydride, (2,5-dioxotetrahydrol)-3-methyl 3-cyclohexene-1,2 dicarboxylic anhydride and succinic anhydride.

26. The method of claim 12, further comprising:
mixing the hydrolytically stable polymer dispersion with an emulsifier and water; and
subjecting the mixture to shear forces.

27. The method of claim 26, wherein said emulsifier is selected from the group consisting of cationic surfactants, anionic surfactants, and non-ionic surfactants.

28. The method of claim 12, further comprising incorporating hydrophilic moieties into the polymers of the hydrolytically stable polymer dispersion.

29. The method of claim 28, wherein incorporating hydrophilic moieties into the polymers of the hydrolytically stable polymer dispersion comprises incorporating hydrophilic moieties by condensation reaction.

30. The method of claim 28, wherein the hydrophilic moieties are selected from the group consisting of poly(ethylene glycol), methoxy terminated poly (ethylene glycol), poly (propylene glycol), methoxy-terminated poly (propylene glycol) and metal salts of sulfo-isophthalic acid.

31. The method of claim 12, wherein at least 5 mole percent of the polymer backbone ester linkages are formed from secondary and/or tertiary hydroxy groups.

32. The method of claim 12, wherein at least 10 mole percent of the polymer backbone ester linkages are formed from secondary and/or tertiary hydroxy groups.

33. The method of claim 12, wherein at lest 15 mole percent of the polymer backbone ester linkages are formed from secondary and/or tertiary hydroxy groups.

34. The method of claim 12, wherein at least 20 mole percent of the polymer backbone ester linkages are formed from secondary and/or tertiary hydroxy groups.

35. The method of claim 12, wherein at least 25 mole percent of the polymer backbone ester linkages are formed from secondary and/or tertiary hydroxy groups.

36. A paint composition comprising a pigment and at least one polyester and alkyd polymer dispersion, wherein at least 5 mole percent of the polymer ester linkages of the polyester and alkyd polymers are formed from secondary and/or tertiary hydroxy groups.

37. An ink composition comprising a pigment and at least one polyester and alkyd polymer dispersion, wherein at least 5 mole percent of the polymer ester linkages of the polyester and alkyd polymers are formed from secondary and/or tertiary hydroxy groups.

38. An adhesive composition comprising polyester and alkyd polymers, wherein at least 5 mole percent of the ester linkages of the polyester and alkyd polymers are formed from secondary and/or tertiary hydroxy groups.